The Beagle, Records of the Northern Territory Museum of Arts and Sciences, 1988, **5**(1): 51-69

A NEW GENUS AND FIVE NEW SPECIES OF CALLIANASSIDAE (CRUSTACEA: DECAPODA: THALASSINIDEA) FROM NORTHERN AUSTRALIA

K. SAKAI
Laboratory of Crustacea, Shikoku Women's University, 711-11 Tokushima, Ohjincho-Furukawa, Japan.

ABSTRACT

A new genus, *Neocallichirus* and five new species, *N. darwinensis* and *N. horneri* (type species) from around Darwin, Northern Territory, Australia, and *Callianassa acutirostella, C. parvula* and *Neocallichirus caechabitator* from Australian North West Shelf, of Callianassidae (Crustacea: Decapoda: Thalassinidea) are described. *Callianassa praedatrix* de Man, originally reported from Indonesia, is recorded for the first time from Australia. A key to Australian callianassid species is provided.

KEYWORDS: Crustacea, Decapoda, Thalassinidea, Callianassidae, *Callianassa*, new taxa, North West Shelf, Northern Australia.

INTRODUCTION

Some specimens of the family Callianassidae Dana in the collection of the Northern Territory Museum in Darwin have been studied. The material includes specimens collected in 1983 by the R. V. "Soela" (CSIRO) survey in North West Shelf, Western Australia and collections made around Darwin.

All of the Australian callianassids are revised, and a new genus, *Neocallichirus*, is proposed. From north Western Australia two new species, *Callianassa acutirostella* and *C. parvula*, are recorded by the R.V. "Soela". *C. praedatrix* de Man, which was originally reported from Indonesia, is also recorded from North West Shelf as the first Australian record. *C. amboinensis* de Man, which was recorded from Dampier Archipelago by Poore and Griffin (1979:248), is collected also from North West Shelf and added to its callianassid fauna. From the Northern Territory three new species, *Neocallichirus darwinensis, N. horneri* and *N. caechabitator* are now reported.

Fifteen species of Australian callianassid species were described by Poore and Griffin (1979) and one new species by Sakai (1984), so the number of Australian callianassids is increased from 16 to 22 species by adding the five new species described in the present paper and the Indonesian species *C. praedatrix* de Man.

The 22 Australian species are: *Callianassa acutirostella* sp. nov.; *C. amboinensis* de Man, 1888; *C. arenosa* Poore, 1975; *C. australiensis* (Dana, 1852); *C. ceramica* Fulton and Grant, 1906; *C. joculatrix* de Man, 1905; *C. parvula* sp. nov.; *C. praedatrix* de Man, 1905; *Glypturus collaroy* (Poore and Griffin, 1979); *G. karumba* (Poore and Griffin, 1979); *G. martensi* (Miers, 1884); *G. mucronata* (Strahl, 1861); *Calliax aiquimana* (Baker, 1907); *C. bulimba* (Poore and Griffin, 1979); *C. tooradin* (Poore and Griffin, 1979); *Neocallichirus caechabitator* sp. nov.; *N. horneri* sp. nov.; *N. limosa* (Poore, 1975); *N. darwinensis* sp. nov.; *Gourretia coolibah* Poore and Griffin, 1979; *G. manihaniae* Sakai, 1984; *Ctenaocheles collini* Ward, 1945.

Owing to the habit of burrowing in sand and mud, specimens of callianassid species are rarely obtained and, even if captured, they are often much damaged in many cases. Of the five new species described in the present paper two lack both first pereiopods and one lacks its larger cheliped. The key to Australian callianassid species (except the species of *Gourretia* de Saint Laurent and *Ctenocheles* Kishinouye is newly provided for application to damaged specimens without pereiopods.

SYSTEMATICS

Family Callianassidae Dana

Callianassidae Dana, 1852:12. — de Saint Laurent 1974:513.

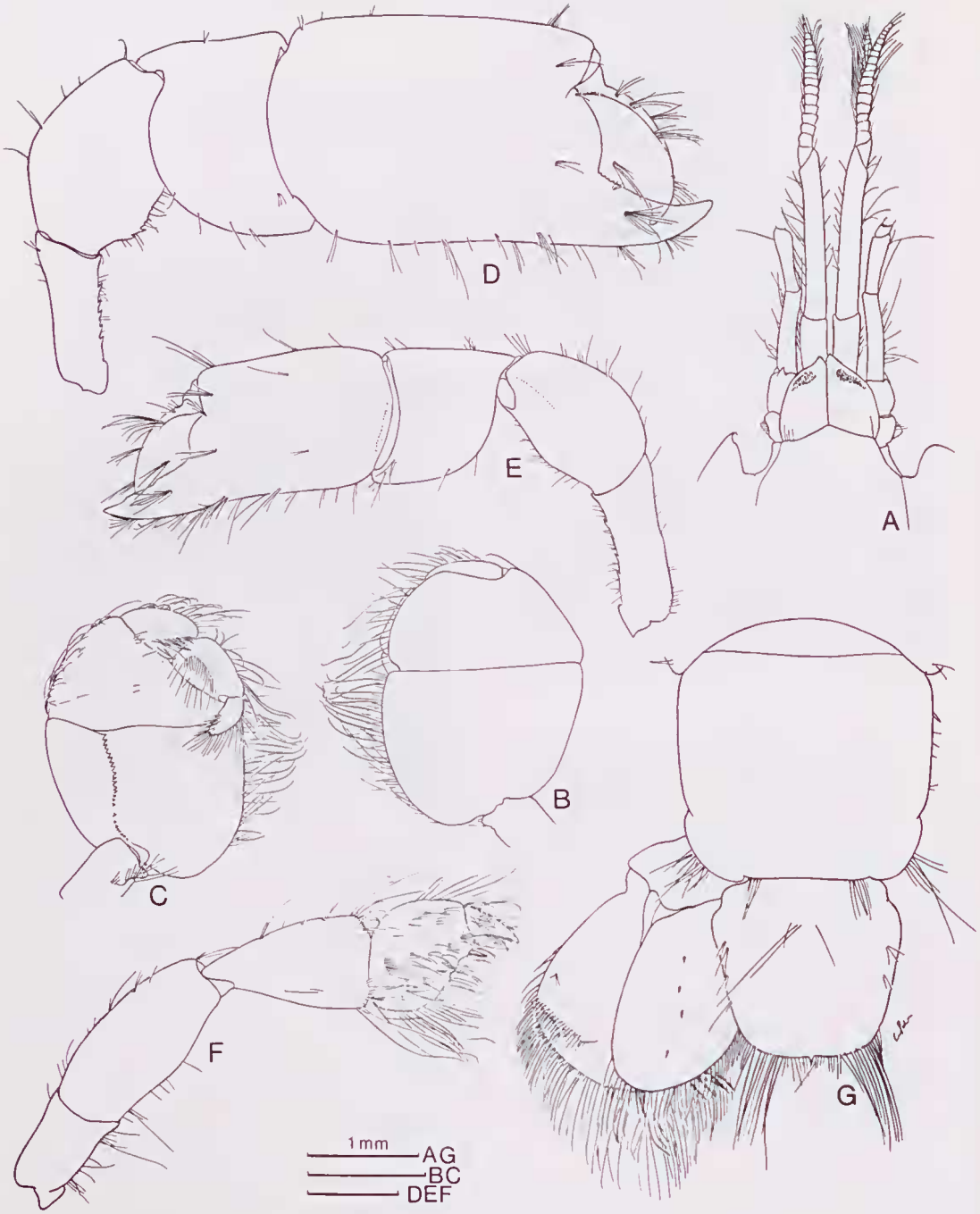

Fig. 1. *Callianassa amboinensis* NTM Cr.005176♀ : **A,** anterior carapace and antennae, dorsal aspect; **B,** third maxilliped, outer aspect; **C,** same, inner aspect; **D,** larger cheliped, outer aspect; **E,** smaller cheliped, outer aspect; **F,** third pereiopod, outer aspect; **G,** sixth abdominal segment and tail-fan, dorsal aspect.

Diagnosis. Linea thallassinica present. No epipods on pereiopods. Posterior lobe of scaphoecrite (maxilla 2) without long distal seta. Pleopod 2 different from following pleopods (except in *Callianopsis* de Saint Laurent, 1974; *Ctenocheles* Kishinouye, 1926). Uropod exopod often bilobed. Cheliped large with carpus markedly expanded compared to merus (except *Calliapagurops* de Saint Laurent, 1974).

Australian genera included. *Callianassa* Leach, 1814; *Glypturus* Stimpson, 1866; *Calliax* de Saint Laurent, 1974; *Neocallichirus* gen. nov.; *Gourretia* de Saint Laurent, 1974; *Ctenocheles* Kishonouye, 1926.

Remarks. de Saint Laurent (1974:513) assigned eight genera to Callianassinae on the form of the maxillipeds 1 and 3, uropod exopod, rostral carina, oval of the carapace, cardiac protuberance and others, and later in 1979 she established another new genus, *Paracalliax* from Mauritania, West Africa. However, not all of the genera recognized by de Saint Laurent were accepted by other workers (Manning and Felder 1986:437). In 1986 Manning and Felder redefined *Glypturus* as a distinct genus and later in 1987 Manning established a new genus, *Corallianassa* Manning. He distinguished *Glypturus* from all the other callianassid genera by the combination of characters such as chelipeds, rostrum, lateral rostral spines and the cornea, however, the chelipeds of *Callianassa* sensu lato are known to be sexually dimorphic (Poore 1975:205), so it seems that the characters of rostrum, lateral rostral spines and cornea are not homogeneous in the respective genera.

In this paper de Saint Laurent's scheme of *Callianassa* sensu lato is revised and *Neocallichirus* gen. nov is proposed.

Key to Australian Callianassidae

1. Antennular peduncle exceeding antennal peduncle 2
   Antennular peduncle shorter than antennal peduncle 7
2(1). Rostrum distinct, broad or narrow acute spine ..... *Callianassa* (part) 3
   Rostrum short, broadly-based, obtuse or sharp 5
3(2). Rostrum exceeding eyestalks; (telson slightly wider than long, without median spine) ..... *C. parvula* sp. nov.
   Rostrum shorter than eyestalks 4
4(3). Telson 1.2 times as wide as long, bearing triangular median spine on posterior margin; maxilliped 3 operculiform, merus width 0.6 length of ischium and merus combined .... *C. acutirostella* sp. nov.
   Telson 1.5 times as wide as long, without median spine on posterior margin; maxilliped 3 subpediform, ischium and merus narrow .... *C. joculatrix* de Man
5(2). Antennular pedunele slightly longer than antennal; (telson subquadrate; maxilliped 3 merus width 0.6 length of merus and ischium combined) .... *C. arenosa* Poore
   Antennular peduncle distinctly longer than antennal peduncle 6
6(5). Maxilliped 3 combined merus and ischium oval; precorneal region elongate, exceeding antennule segment ... . *C. amboinensis* de Man
   Maxilliped 3 merus produced on its inner distal part; precorneal region rounded, not exceeding antennule segment .... *C. australiensis* (Dana)
7(1). Maxilliped 3 propodus and dactylus both tapering ..... *Callianassa* (part) 8
   Maxilliped 3 propodus subquadrate or subovate and dactylus broadened ..... *Calliax* 9
   Maxilliped 3 propodus subquadrate and dactylus slender 11
8(7). Maxilliped 3 merus with distal median spine ..... *C. praedatrix* de Man
   Maxilliped 3 merus without distal median spine; (anterior part of carapace strongly downturned) .... *C. ceramica* Fulton and Grant
9(7). Maxilliped 3 with long exopod; pigmented area of cornea small .... *C. tooradin* (Poore and Griffin)
   Maxilliped 3 without exopod; pigmented area of cornea large 10
10(9). Telson concave posteriorly, widest at midpoint ..... *C. aequimana* Baker
   Telson straight posteriorly, widest proximally .... *C. bulimba* (Poore and Griffin)
11(7). Uropod exopod tapering posteriorly ..... *Glypturus* 12

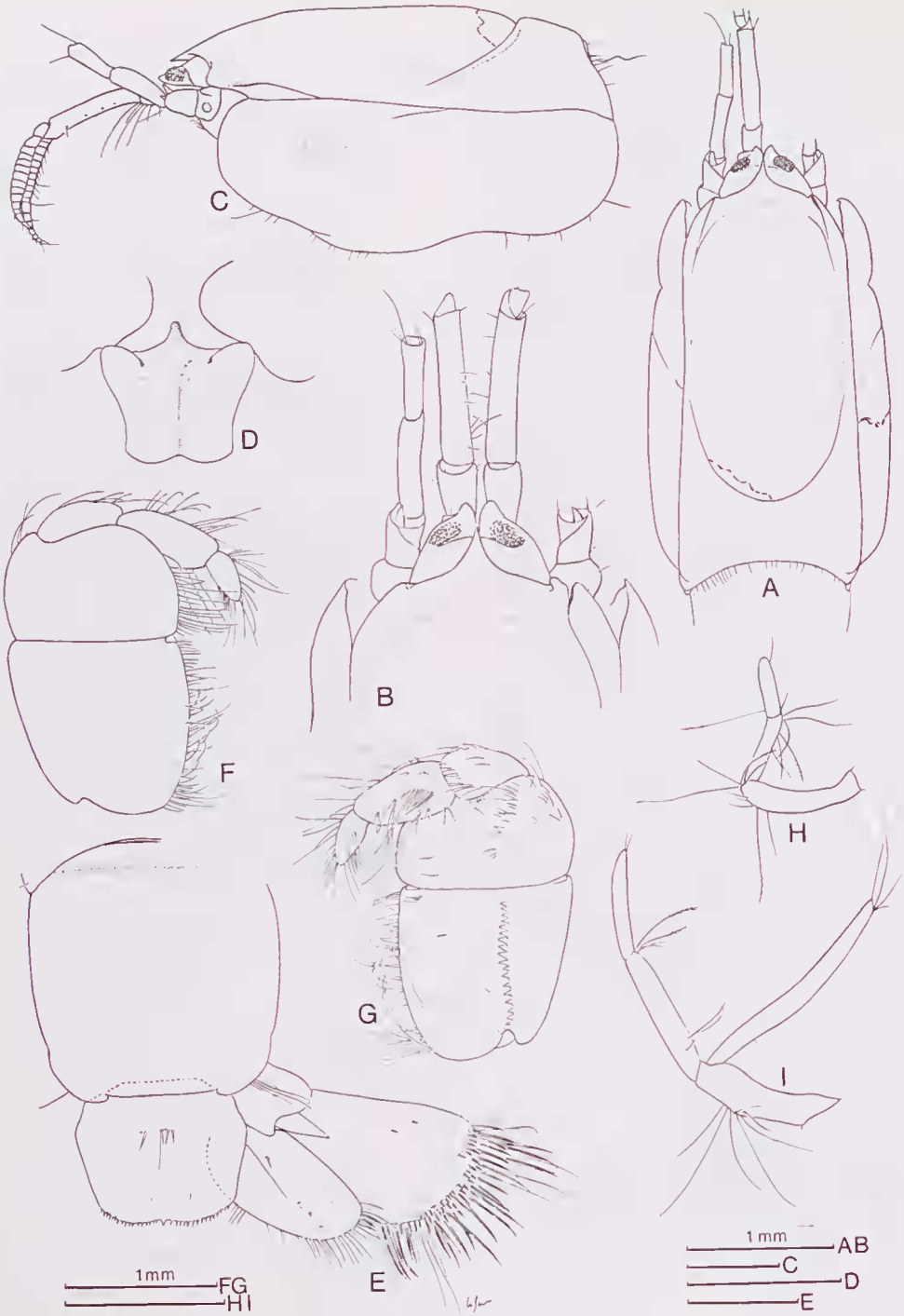

Fig. 2. *Callianassa acutirostella* holotype ♀ : **A**, carapace and antennae, dorsal aspect; **B**, anterior carapace and antennae, dorsal aspect; **C**, carapace and antennae, lateral aspect; **D**, third sternite, ventral aspect; **E**, sixth abdominal segment and tail-fan, dorsal aspect; **F**, third maxilliped, outer aspect; **G**, same, inner aspect; **H**, first pleopod in female; **I**, second pleopod in female.

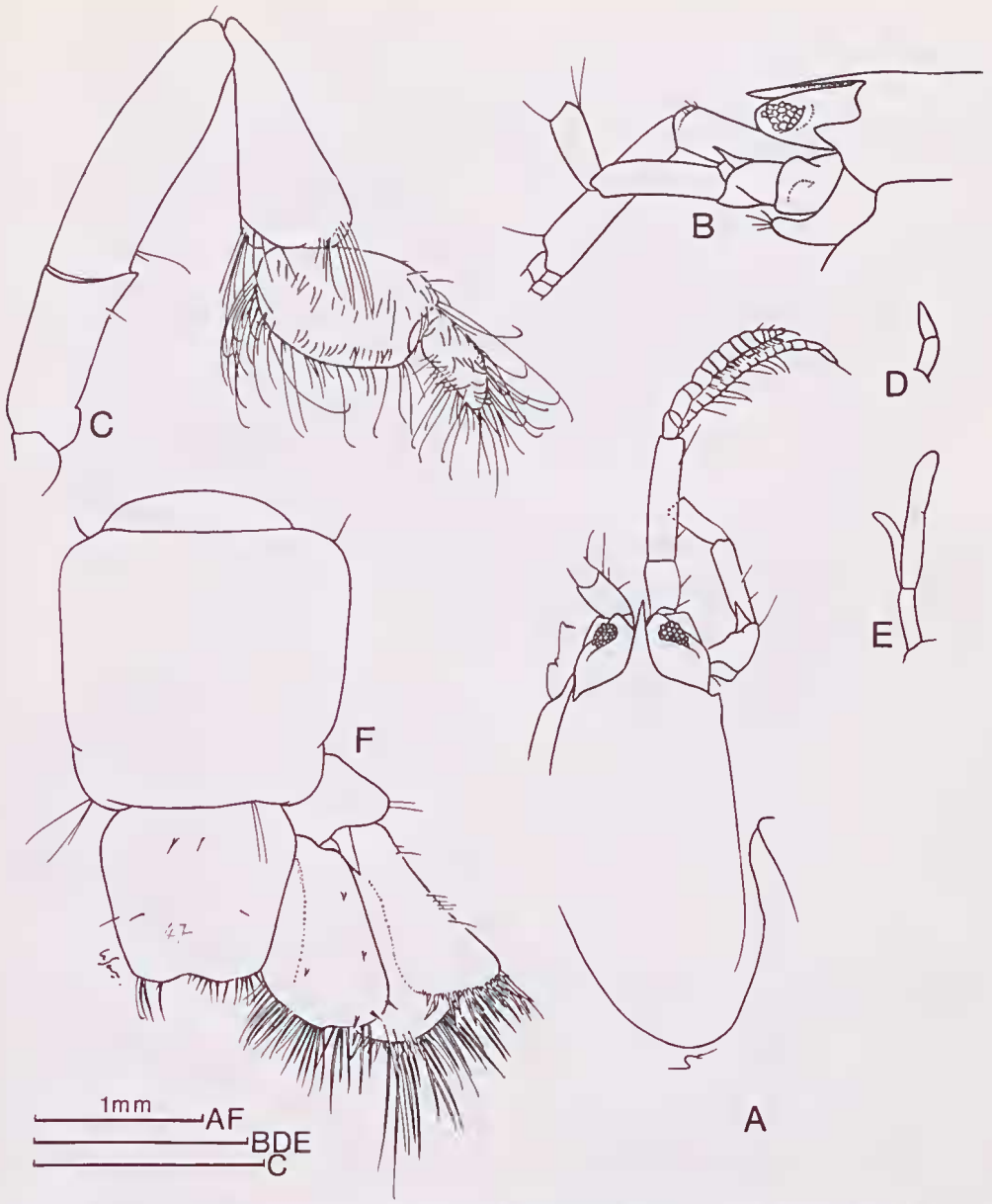

Fig. 3. *Callianassa parvula* holotype ♀ : **A,** anterior carapace and antennae, dorsal aspect; **B,** same, lateral aspect; **C,** third pereiopod, outer aspect; **D,** first pleopod in female; **E,** second pleopod in female; **F,** sixth abdominal segment and tail-fan, dorsal view.

Uropod exopod broadened posteriorly .. *Neocallichirus* 15

12(11).Rostrum distinct, broad or narrow acute spine; lateral projections spinose 13
Rostrum short, broadly-based, obtuse or sharp; lateral projections short, obtuse or obsolete 14

13(12).Telson subovate, widest at midpoint; rostrum directed anteriorly ..... *G. collaroy* (Poore and Griffin)
Telson tapering, widest proximally; rostrum directed upwards ..... *G. martensi* (Miers)

14(12).Pereiopod 3 propodus not produced on posterior margin; larger cheliped merus convex on dorsal margin; maxilliped 3 without exopod ..... *G. mucronata* (Strahl)
Pereiopod 3 propodus distinctly pro-

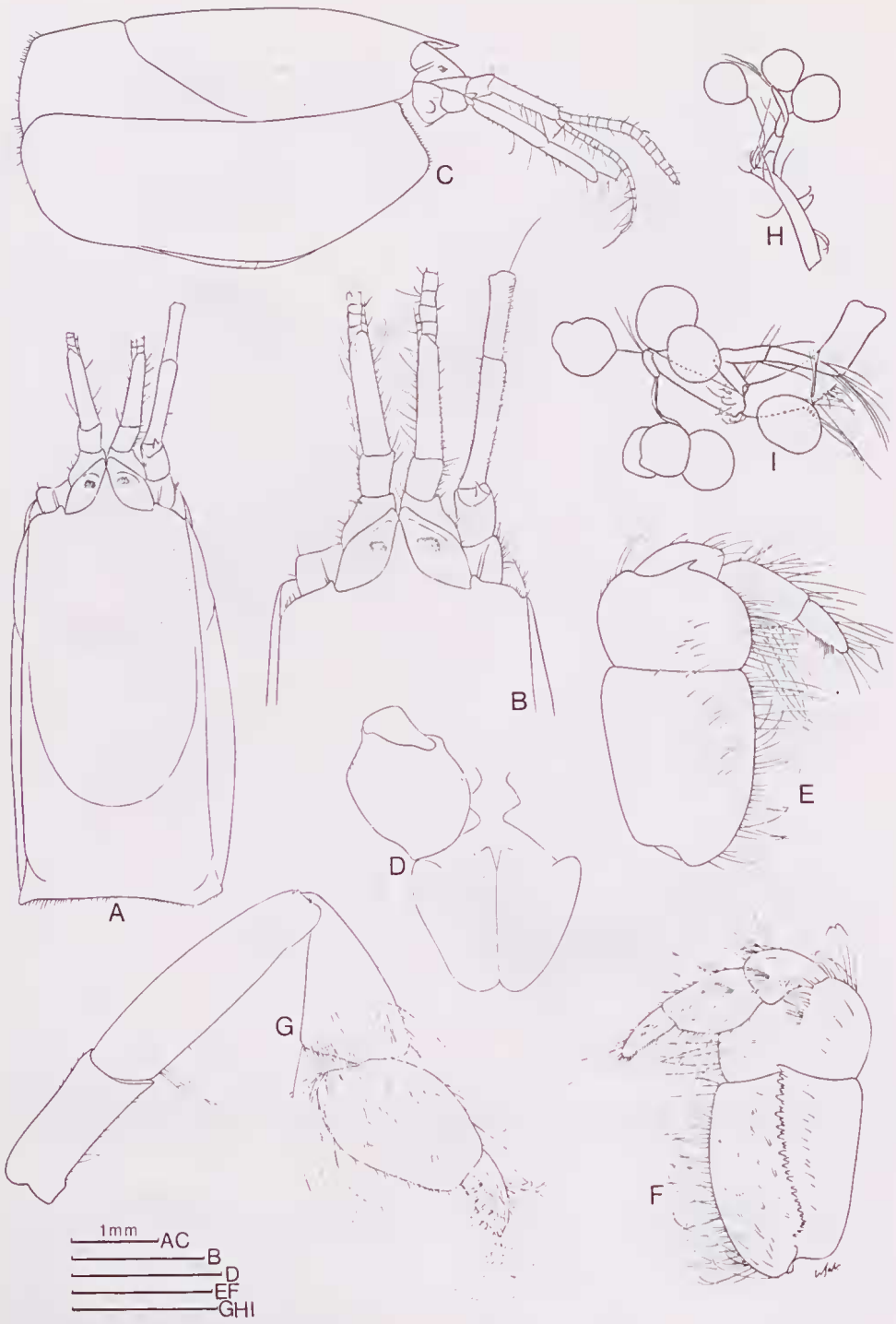

Fig. 4. *Callianassa praedatrix* NTM Cr.005175 ovig. ♀ : **A,** carapace and antennae, dorsal aspect; **B,** anterior carapace, dorsal aspect; **C,** carapace and antennae, lateral aspect; **D,** third sternite, ventral aspect; **E,** third maxilliped, outer aspect; **F,** same, inner aspect; **G,** third pereiopod, outer aspect; **H,** first pleopod with eggs; **I,** second pleopod with eggs.

duced on posterior margin; larger cheliped merus straight on dorsal margin, irregularly spinose ventrally; maxilliped 3 with small exopod .... *G. karumba* (Poore and Griffin)

15(11). Pereiopod 3 propodus distinctly produced on posterior margin .... *N. horneri* sp. nov. Pereiopod 3 propodus not produced on posterior margin 16

16(15). Eye peduncle truncate distally. Pigmented area of cornea compact and subdistally situated .... *N. darwinensis* sp. nov. Eye peduncle rounded distally .. 17

17(16). Larger cheliped merus with strong proximal hook on ventral margin; eye central ..... *N. limosa* (Poore) Larger cheliped merus proximally serrated on ventral margin; eye subdistal ..... *N. caechabitator* sp. nov.

Genus Callianassa Leach

Callianassa Leach, 1814:386, 400; de Saint-Laurent 1974:514 (type species *Cancer (Astacus) subterraneus* Montagu, 1808).

Trypaea Dana, 1852:513, synonymized by de Saint Laurent 1973:514.

Diagnosis. Carapace with well defined oval, without rostral carina or posterior protuberance. Maxilliped 3 without exopod, endopod pediform or operculiform, propodus less than 3 times broader than dactylus, dactylus narrow.

Species included. *C. parvula* sp. nov.; *C. acutirostella* sp. nov.; *C. joculatrix* de Man (1905:610); *C. arenosa* Poore, (1975:197); *C. amboinensis* de Man, (1888:480); *C. australiensis* (Dana, 1852:573); *C. praedatrix* de Man, (1905:607); *C. ceramica* Fulton and Grant, (1906:121).

Callianassa amboinensis De Man

(Fig. 1)

Callianassa amboinensis de Man, 1888:480-482, Pl. 20, Fig. 4. — Poore and Griffin 1979:248-250, Fig. 14. — Sakai 1984:96-99, Figs 1-2.

Material. 1 ♀ , NTM Cr. 005176, TL 21mm, CL 4mm, Stn C1/44, Table Head, Port Essington, Northern Territory, 11° 14.8′S 132° 10.8′E, 11.v.1983, scuba, N.L. Bruce.

Remarks. The present small female specimen, probably immature, is to be assigned as de Man's species *C. amboinensis* on account of the shapes of pigmented area, antennular peduncles, 3rd maxillipeds, 1st pereiopods, tail-fan and the propodus of 3rd pereiopods (Fig. 1A-G).

Distribution. This species is widely distributed on reefs at: Heron Island, Queensland; Port Essington, Northern Territory; Dampier Archipelago, north Western Australia; Ambon, Indonesia (type locality). This is the first record from Northern Territory.

Callianassa acutirostella sp. nov.

(Fig. 2)

Type material. HOLOTYPE — ♀ , NTM Cr.000786, TL 20mm, CL 4.5mm, RV "Soela", Stn. B4, epibenthic sledge, North West Shelf, Western Australia, 19° 05.1′S 118° 53.7′E, 82m, 27.iv.1983, T. Ward.

Description. Female. Rostrum (Fig. 2A-C) broadly-based downturned acute spine, more than half length of eyestalks; both lateral projections obsolete. Cervical groove situated on posterior fifth of carapace, including rostrum. Pereiopod 3 sternite convex with shallow median suture on surface (Fig. 2D).

Eyestalks converging anteriorly with obtuse innerdistal tip, reaching slightly beyond antennular peduncular segment 1; pigmented area large, subterminal. Antennular peduncular segment 1 slightly longer than segment 2, distal segment long, more than three times as long as segment 2; flagella subequal to terminal peduncular segment. Antennal peduncle shorter than antennular reaching before distal part of antennular peduncular segment 3; terminal segment shorter than penultimate; scaphocerite small, rod-like.

Maxilliped 3 (Fig. 2F, G) merus width about 0.6 length of ischium and merus combined, merus 0.6-0.7 length of ischium; ischium with curved row of 18 spinules on inner surface. Carpus slightly broadened distally; propodus tapering, simple, more than half as wide as long; dactylus tapering, length about same width of propodus.

Pereiopods 1 and 3 missing.

Pleopod 1 in female (Fig. 2H) uniramous, slender, three-segmented. Pleopod 2 (Fig.

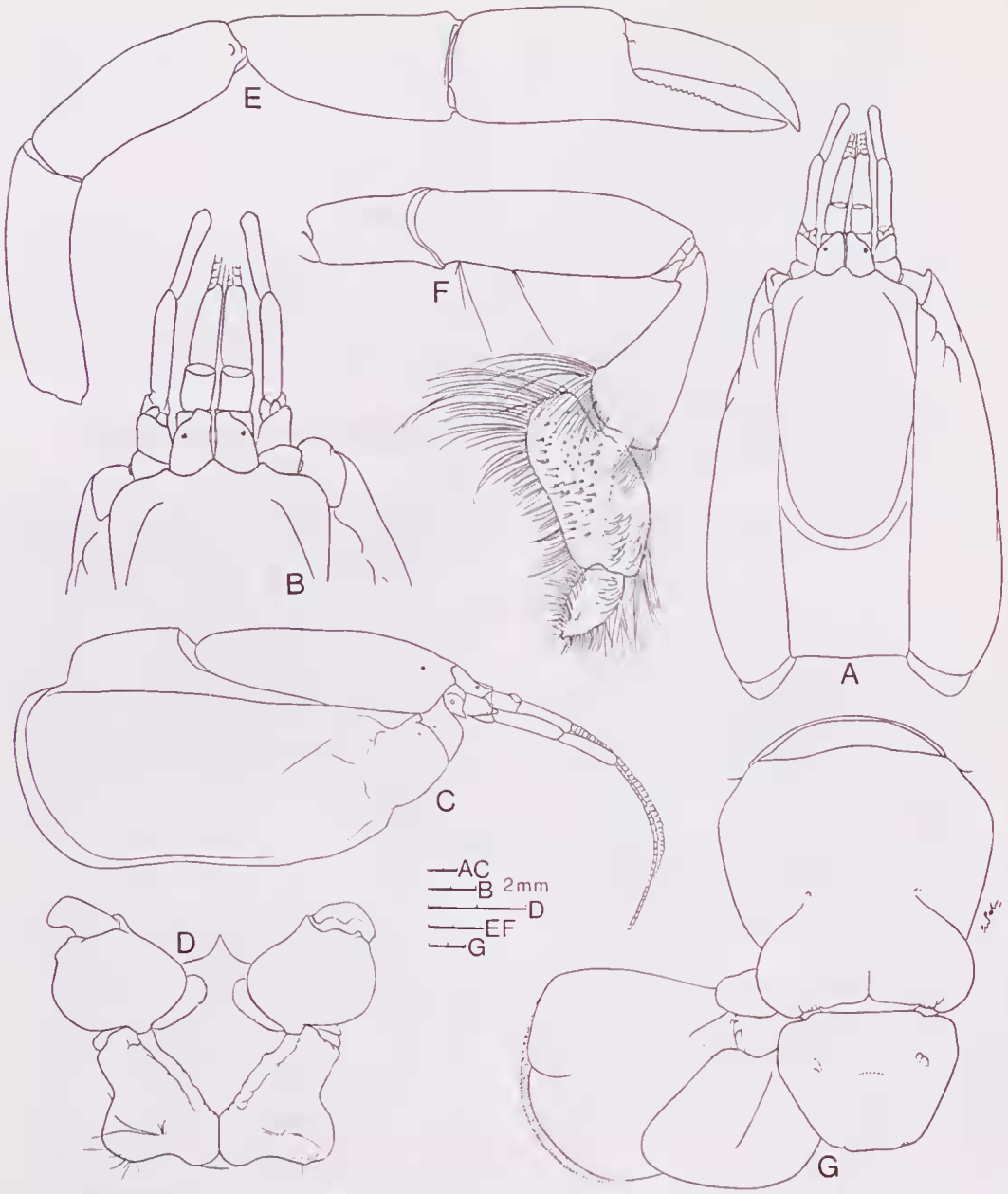

Fig. 5. *Neocallichirus darwinensis* holotype ♀: **A,** carapace and antennae, dorsal aspect; **B,** anterior carapace, dorsal aspect; **C,** carapace and antennae, lateral aspect; **D,** third sternite, ventral view; **E,** smaller cheliped, outer aspect; **F,** third pereiopod, outer aspect; **G,** sixth abdominal segment and tail-fan, dorsal aspect.

2I) biramous, slender; exopod subequal to two-segmented endopod.

Telson (Fig. 2E) 1.2 times as wide as long, converging posteriorly on distal two-thirds, posterior margin armed with triangular median spine; endopod 1.6 times as long as wide, overreaching telson and with median carina on proximal two-thirds; exopod longer and wider than endopod, straight on lateral margin and largely convex on posterior margin, continuous to medial margin.

Etymology. This species is named from the latin words, *acutus* meaning sharp and *rostellum*, diminitive form of rostum as shown in the morphology.

Remarks. The present specimen is small in size, only measuring 20mm in total length, but can be safely considered mature as the first and second pleopods are well developed with plumose setae.

C. acutirostella is similar to *C. parvula* and *C. joculatrix* in having a spinose rostrum and the antennular peduncle exceeding the antennal peduncle, but distinguished from the latter two species in the shapes of the 3rd maxillipeds and the tail-fan. In *C. parvula* the 3rd maxillipeds are lost, so it is impossible to compare it with the other two species, however the telson is slightly wider than long and without a posterior median spine, while in *C. acutirostella* it is 1.2 times as wide as long and with a posterior median spine and in *C. joculatrix* 1.5 times as wide as long and without a posterior median spine. In *C. joculatrix* the shape of the 3rd maxillipeds is characteristic as it is narrow. The relationship between *C. acutirostella* and *C. parvula* are further described in the remarks on *C. parvula.*

Distribution. North West Shelf, Western Australia, shallow water.

Callianassa parvula sp. nov.
(Fig. 3)

Type material. HOLOTYPE — ♂, NTM Cr.000783, TL 15mm, CL 4mm, R.V. "Soela", epibenthic sledge, North West Shelf, Western Australia, 19° 04.4′S 118° 47.35′E, 83m, 27.iv.1983, T. Ward.

Description. Male. Carapace thinly calcified and much damaged. Rostrum (Fig. 3A,B) narrow forwardly-directed acute spine, overreaching eyestalks; lateral projections obtuse, half length of eyestalks. Cervical groove on posterior fourth of carapace, exeluding rostrum.

Eyestalks converging anteriorly from about mid-length to obtuse apex; pigmented area large, subdistal on outer-lateral margin. Antennular peduncular segment 1 nearly reaching distal margin of eyestalk; terminal segment elongate, more than twice length of segment 2; antennular flagella short, thick, slightly longer than segments 2 and 3 combined. Antennal peduncular segment 4 distinetly overreaching antennular penultimate segment; segment 5 shorter than segment 4, failing to reach distal margin of antennular pedunele; scaphocerite slender and acute at tip.

Maxillipeds 3 and pereiopods 1 missing.

Pereiopods 3 (Fig. 3C) propodus 1.5 times as long as broad, posterior margin rounded; dactylus about 0.33 length of propodus.

Pleopod 1 in male (Fig. 3D) simple, small and two-segmented. Pleopod 2 (Fig. 3E) biramous; endopod and exopod narrow, leaf-like.

Telson (Fig. 3F) slightly wider than long, converging distally from near its proximal to distal angle; distal margin slightly concave and without median spine. Uropodal endopod longer than telson; exopod slightly longer than endopod, lateral margin largely concave.

Etymology. The species is named from the latin words, *parvus* meaning small and *ule,* the latin diminutive suffix.

Remarks. The holotype is much damaged, however its characteristics are discernible from other species.

As mentioned in the remarks of *C. acutirostella, C. parvula* is closely related to *C. acutirostella* in the acute rostrum and the elongated terminal segment of antennular peduncle and also the large pigmented area of the eyestalks, however it differs in that, in *C. parvula,* the rostrum is a narrow acute spine, much longer than the eyestalks and the scaphoeerite is distinct, slender and with an aeute tip, while in *C. acutirostella,* the rostrum fails to reach the distal margin of the eyestalks and the scaphocerite is small.

Distribution. North West Shelf, Western Australia, shallow waters.

Callianassa praedatrix de Man
(Fig. 4)

Callianassa praedatrix de Man, 1905:607.
Callianassa (Cheramus) praedatrix — de Man 1928:146, Pl. 15, Figs 22-22d.

Material. 1 ovig. ♀, NTM Cr.005175, TL wanting abdominal somite 6 and telson 15mm, CL including rostrum 5mm., RV "Soela", trawl, North West Shelf, Western Australia, 19° 58.4′S 117° 49.1′E, 42m, 26.vi.1983.

Description. Damaged female speeimen. Rostrum (Fig. 4A-C) anteriorly-direeted acute triangle, more than half length of eyestalks; lateral projections obtusely triangular, 0.2 length of eyestalks. Dorsal transverse part of eervical groove situated on posterior fourth of earapace, exeluding rostrum. Pereiopod 3 sternite (Fig. 4D) heart-shaped

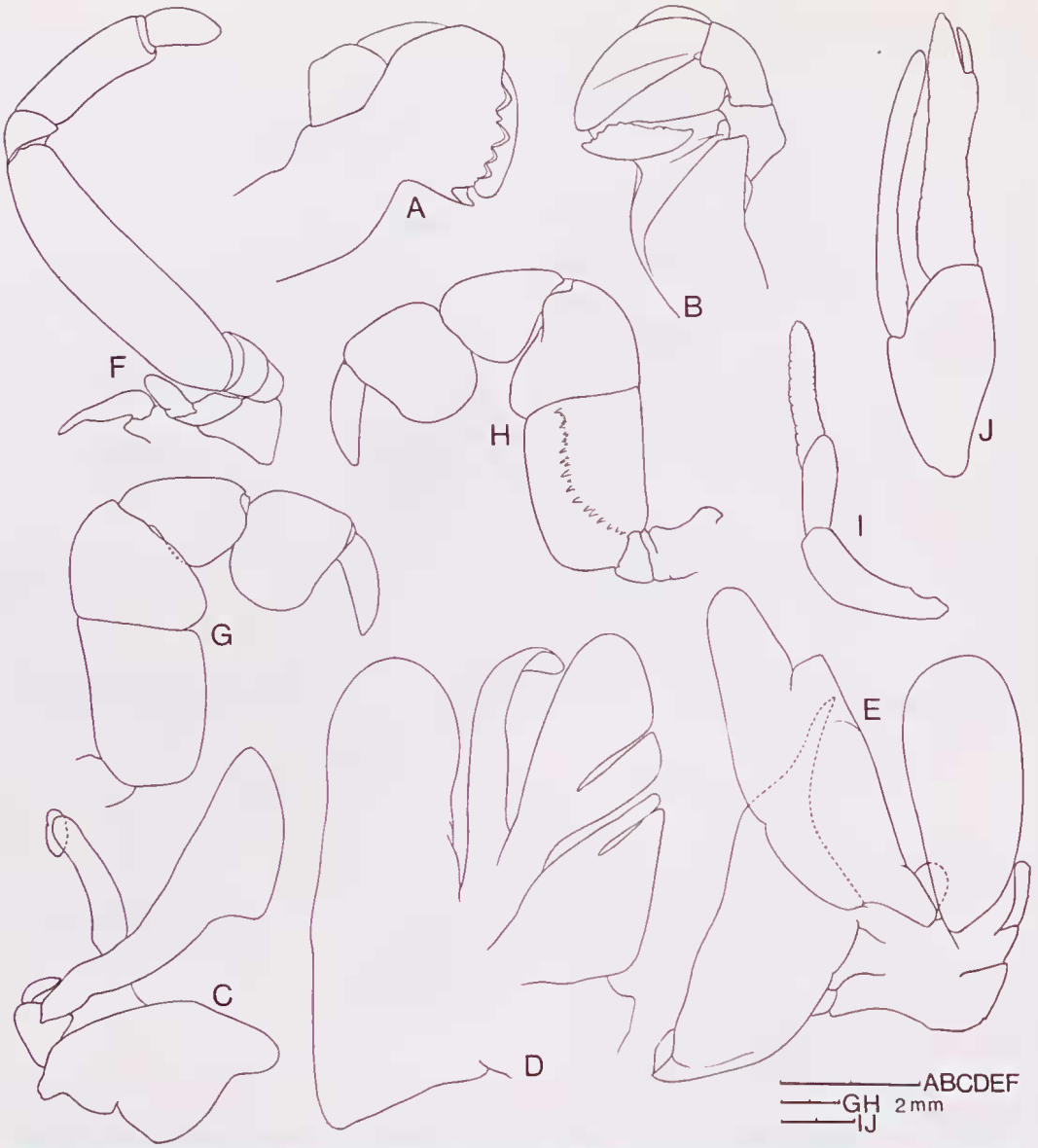

Fig. 6. *Neocallichirus darwinensis* holotype ♀ : **A,** mandible, outer aspect; **B,** same, inner aspect; **C,** maxillule, outer aspect; **D,** maxilla, outer aspect; **E,** first maxilliped, outer aspect; **F,** second maxilliped, outer aspect; **G,** third maxilliped, outer aspect; **H,** same, inner aspect; **I,** first pleopod in female; J, second pleopod in female.

with narrow median groove, laterally thickened with rounded anterolateral angle.

Eyestalks medially contiguous, converging anteriorly from about mid-length, apex obliquely truncate, reaching before distal margin of antennular peduncular segment 1; dorsal surface transversely concave anterior to pigmented area; eye large, central. Antennular peduncular segment 1 thick, about twice length of segment 2, latter about one third length of distal segment; flagella slightly shorter than peduncle. Antennal peduncle exceeding antennular by proximal part of distal segment, penultimate segment about 1.5 times as long as distal; scaphocerite short and pointed, flagellum wanting.

Eyestalks medially contiguous, converging anteriorly from about mid-length, apex obliquely truncate, reaching before distal margin of antennular peduncular segment 1; dorsal surface transversely concave anterior to pigmented area; eye large, central. Anten-

nular peduncular segment 1 thick, about twice length of segment 2, latter about one third length of distal segment; flagella slightly shorter than peduncle. Antennal peduncle exceeding antennular by proximal part of distal segment, penultimate segment about 1.5 times as long as distal; scaphoecrite short and pointed, flagellum wanting.

Maxilliped 3 (Fig. 4E, F) merus width about half length of ischium and merus combined; ischium 1.2 times as long as wide, with row of about 37 obtuse, irregularly-sized teeth on inner surface; merus slightly more than 0.5 length of ischium, rounded on medial margin and provided with sharp, inwardly direeted median spinc on distal margin; carpus, propodus and daetylus slender.

Pereiopods 1 wanting.

Pereiopods 3 (Fig. 4G) propodus oval, 1.5 times as long as broad, outer surface setose; dactylus about 0.5 length of propodus.

Pleopods 1 in female (Fig. 4H) uniramous, slender and three-segmented. Pleopods 2 (Fig. 4I) biramous and slender, exopod and endopod two-segmented.

Tail-fan lost.

Remarks. The single female specimen is small in size, measuring only 15mm in total length excluding the 6th abdominal somite and the telson.

Though the speeimen deseribed is without the 1st pereiopods and the tail-fan, it shows sufficient eharaeteristics for it to be identified as *C. praedatrix* in the shape of the 3rd maxillipeds and the 3rd pereiopods, the relative length of the terminal segment of the antennular peduncle, which is three (de Man 1928) or four times (de Man 1905) as long as the penultimate, and the spiniform rostrum, reaching to the middle of 1st segment of the antennular peduncle.

C. praedatrix is elosely related to *C. propinqua* de Man, 1905, *C. modesta* de Man, 1905 from Indonesia and *C. longicauda* Sakai, 1967 from Japan, in bearing a large distal spine on the merus of the 3rd maxilliped.

Distribution. North West Shelf, Western Australia, 42m deep; 4° 20′S 122° 58′E, between Wowoni and Butung, Indonesia, 75-94m (Type locality). New to the Australian fauna.

Genus *Glypturus* Stimpson

Glypturus Stimpson, 1866:46. — Manning and Felder 1986:437 (type species *Glypturus acanthochirus* Stimpson, 1866).

Diagnosis. Carapace with well defined oval, without rostral carina or cardiac protuberance. Maxilliped 3 with or without exopod, endopod subpediform or operculiform, propodus expanded, over 3 times broader than dactylus. Uropod endopod tapering distally. Telson much broader than long, and much shorter than uropod.

Australian species included. *G. collaroy* (Poore and Griffin 1979:260); *G. martensi* (Miers, 1884:13) (= *Callianassa haswelli,* Poore and Griffin, 1979, synonymized by Sakai 1984:99); *G. mucronata* (Strahl, 1861:1056); *G. karumba* (Poore and Griffin, 1979:266).

Genus *Calliax* de Saint Laurent

Calliax de Saint Laurent, 1974:514 (type species *Callianassa lobata* de Gaillande and Lagardere, 1966).

Diagnosis. Carapace without defined oval, without rostral carina or cardiac protuberance. Maxilliped 3 with or without exopod; endopod subpediform or operculiform, propodus expanded, with dactylus nearly as long as broad and with rounded tip.

Australian species included. *C. tooradin* (Poore and Griffin, 1979:275); *C. aequimana* (Baker, 1907:182); *C. bulimba* (Poore and Griffin, 1979:257).

Genus *Neocallichirus* gen. nov.

Type Spccies. *Neocallichirus horneri* sp. nov.

Diagnosis. Carapace with well defined oval, without rostral carina or cardiac protuberance. Maxilliped 3 without exopod, endopod subpediform, propodus expanded, over 3 times broader than dactylus. Uropod endopod broadened posteriorly. Telson about as long as broad, about as long as uropod.

Australian species included. *N. horneri* sp. nov., *N. darwinensis* sp. nov., *N. limnosa* (Poore), *N. caechabitator* sp nov.

Non-Australian species included. *N. grandimana* (Gibbes, 1850:194); *N. pachydactyla* (A.Milne Edwards, 1870:86); *N. indica* (de Man, 1905:605); *N. moluccensis* (de Man, 1905:606); *N. rathbunae (Schmitt, 1935:4);*

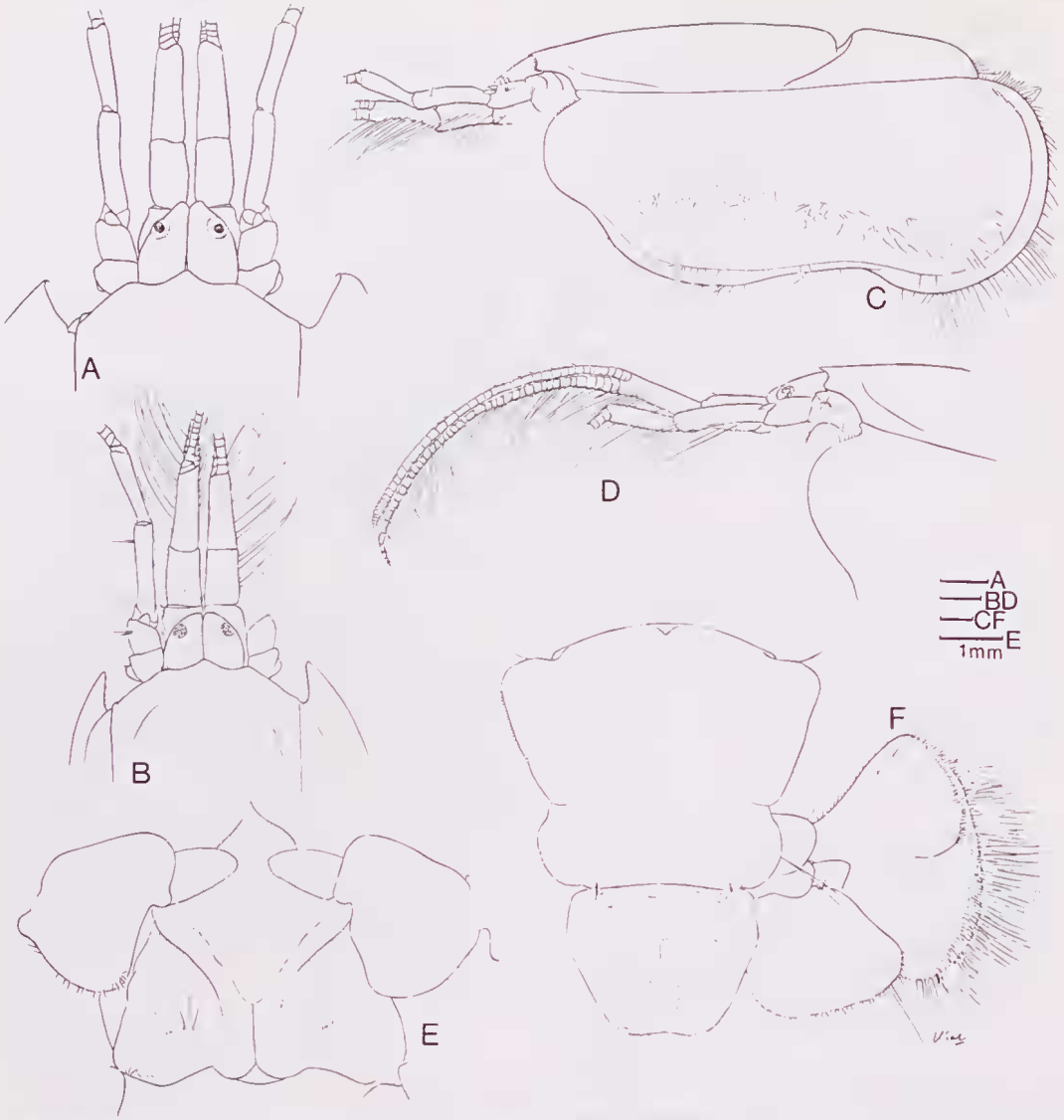

Fig. 7. *Neocallichirus horneri:* **A,** anterior carapace and antennae, dorsal aspect, holotype ♀; **B-F,** paratype ♂ - **B,** anterior carapace and antennae, dorsal aspect; **C,** carapace and antennae, lateral aspect; **D,** anterior carapace, lateral aspect; **E,** third sternite, ventral aspect; **F,** sixth abdominal segment and tail-fan, dorsal aspect.

N. natalensis (Barnard, 1946:379); *N. sassandrensis* (Le Leoff and Intes, 1974:43).

Remarks. This genus is closely related to *Callichirus, Glypturus* and *Calliax* in that the propodus of the maxilliped 3 endopod is expanded, however, it is distinguished from them by a combination of characters as the telson is nearly as long as broad and about as long as the uropod, and the uropod endopod is broadened posteriorly.

Neocallichirus darwinensis sp. nov. (Figs 5, 6)

Type Material. HOLOTYPE — ♀, NTM Cr.000090, TL 110mm, CL 24mm, Mindil Beach, Darwin, Northern Territory, ELWS, 13.xi.1981, J.R. Hanley.

Description. Female. Large species. Rostrum (Fig. 5A-C) broadly-based downturned, obtusely triangular, 0.1-0.2 length of eyestalk; lateral projections broad and obtuse, about as long as or half as long as ros-

trum. Cervical groove deeply incised on posterior third of earapaee. Pereiopod 3 sternite (Fig. 5D) showing eharaeteristie diamond-shaped thiekening (Holthuis and Gottlieb 1958:60); median Y-shaped thickening of this diamond-shaped strueture broadened with two tufts of setae, both lateral platforms smooth on surfaee, eontiguous medially on their posterior halves.

Eyestalks medially eontiguous, eonverging anteriorly from about mid-length to obliquely truneate preeorneal region, reaehing slightly beyond antennular peduncular segment 1; pigmented area eompaet, subdistal.

Antennular peduneular segment 1 about 1.5 times length of segment 2, latter about 0.5 of length of distal segment; flagella subequal, about 1.8 times as long as pedunele. Antennal pedunele exeeeds antennular by proximal part of peduncular segment 5, penultimate segment about 1.2 times long as terminal, seaphoeerite rounded protuberanee; flagellum 40mm in length.

Mandibular palp (Fig. 6A, B) three-segmented, incisor process bearing eight irregular teeth, including proximal triangular tooth separated from others by deep eoneavity, molar proeess with row of obtuse dentieles. Maxillular exopod (Fig. 6C) two-segmented, distal segment short, flattened, distally flexed on proximal segment. Maxillar scaphognathite (Fig. 6D) broad. Maxilliped 1 (Fig. 6E) palp a small rounded lobe. Maxilliped 2 (Fig. 6F) merus broadly bent inward, 1.2 times as long as three distal segments eombined; dactylus short, about 0.5 length of propodus. Maxilliped 3 (Fig. 6G, H) ischium and merus combined as broad plate, former with sinous row of about 30 irregularly arranged spines on inner surfaee; earpus broadened distally; propodus broadly expanded to form subquadrate plate; daetylus slender, about as long as propodus.

Pereiopod 1 larger eheliped missing. Smaller eheliped (Fig. 5E) slender; isehium, merus and carpus elongated, subequal in length. Chela about 1.5 times as long as earpus; fixed finger slightly shorter than daetylus, eutting edge with row of 14 dentieles on proximal two-thirds, dactylus narrow, eutting edge entire.

Pereiopod 3 (Fig. 5F) merus more than twiee length of isehium; earpus about 0.75 length of merus, broadened distally in narrow triangular shape; propodus and daetylus setose, former about 2 times as long as wide, smooth on ventral margin and with rounded posterior lobe almost parallel to ventral margin of earpus, daetylus small and triangular.

Pleopod 1 in female (Fig. 6I) uniramous, three-segmented; pleopod 2 (Fig. 6J) biramous, narrow, leaf-like, endopod broader and longer than exopod, appendix interna rod-like, situated on distal part of medial margin. Pleopods 3-5 biramous, broad, leaf-like, endopod broadened, appendix interna redueed hook in middle part of medial margin.

Telson (Fig. 5G) about half length of abdominal somite 6, about 1.2 times as wide as long, widest proximally, converging posteriorly on distal two-thirds; distal margin narrowly truneate, dorsal surfaee with transverse row of setae in midline and posteriorly longitudinally eoneave with longitudinal rows of setae on both sides. Uropodal exopod about as long as broad, 1.5 times length of endopod; endopod subsquare, distinetly exeeeding telson.

Etymology. The present speeies is named after the locality where the speeimen was eollected.

Remarks. The single female specimen laeks a larger cheliped, however, it shows features enough to be distinguished from other Australian speeies. This speeies is closely related to *N. moluccensis* from the reef of Ambon, Indonesia, in the form of an obliquely truneate precorneal region. The type material of *N. moluccensis*, a male measuring 60mm in length, large enough to show specifie eharaeters, was not aeeessible to me, however it was deseribed by de Man (1905:606; 1928:159), who eompared it with *N. indica*.

In *N. moluccensis* the antennal pedunele projects by nearly two thirds of the terminal segment beyond the antennular pedunele, the terminal and penultimate antennal segments are of nearly equal length; the eyestalks do not reaeh to the distal end of the basal antennular pedunele, and are provided with short setulae on eaeh inner dorsal surfaee; the distinctly faceted and black pigmented eorneae are large, and loeated on the proximal half. On the other hand, *N. darwinensis* shows that the eyestalks overreach the proximal antennular segment, and without short setulae on the inner dorsal surfaee;

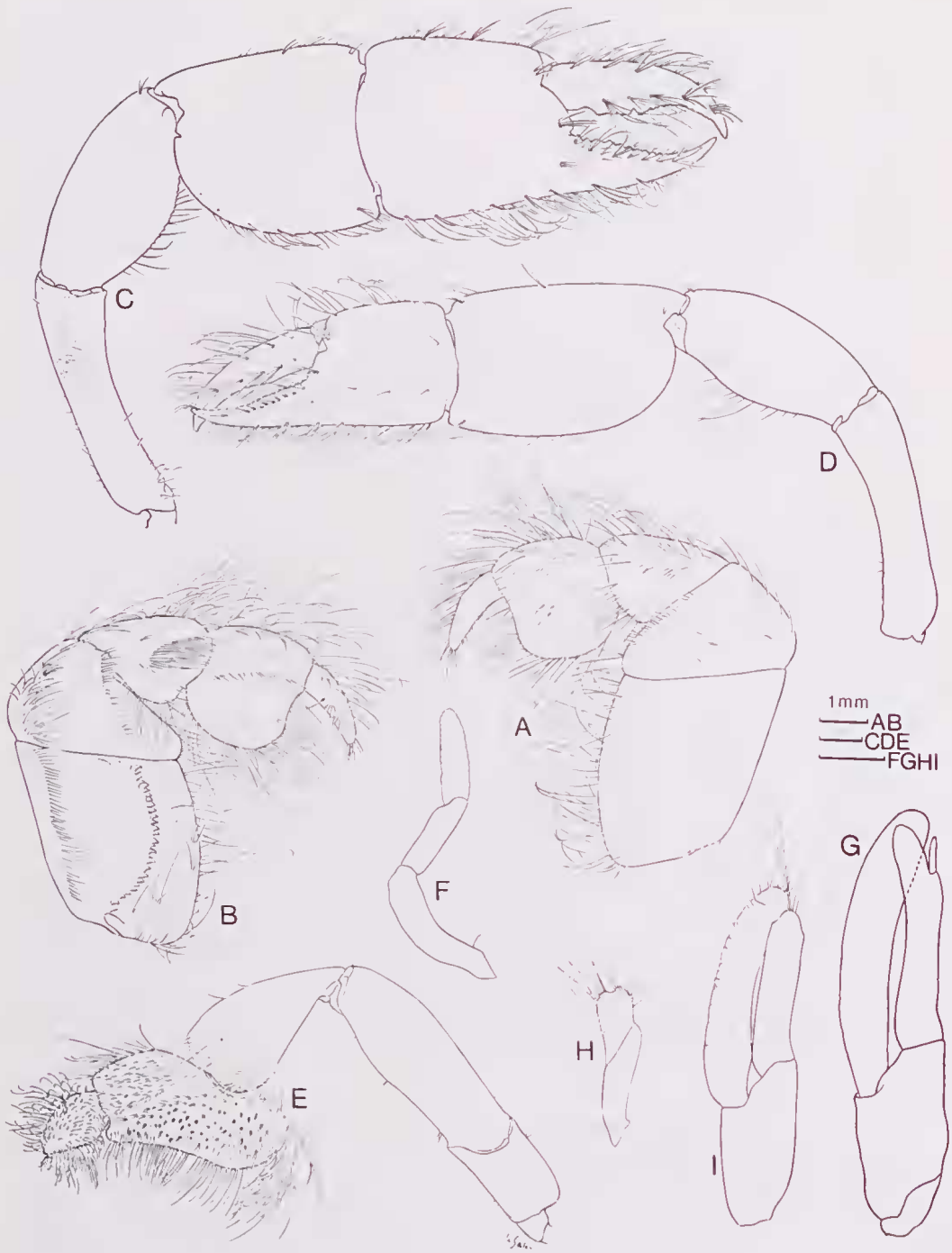

Fig. 8. *Neocallichirus horneri:* **A-B, E, H-I,** paratype ♂ - **A,** third maxilliped, outer aspect; **B,** same, inner aspect; **E,** third pereiopod, outer aspect; **H,** first pleopod in male; **I,** second pleopod in female; **C-D, F-G,** holotype ♀ - **C,** larger cheliped, outer aspect; **D,** smaller cheliped, outer aspect; **F,** first pleopod in female; **G,** second pleopod in female.

and the corneae are reduced, and situated in the distal half.

Neocallichirus horneri sp. nov.

(Figs 7,8)

Type material. HOLOTYPE — ♀, NTM Cr.000846, TL 58mm, CL 13mm, Nightcliff, Darwin, Northern Territory, 15.v.1976, P. Horner. PARATYPE — 1 ♂, NTM Cr.002048, TL 54mm, CL 14mm, 1st pereiopods wanting, West Shoal Bay, Darwin, Northern Territory, intertidal, Northern Territory Fisheries Department.

Description. Female. Rostrum (Fig. 7A-D) broadly-based, downturned, obtusely triangular, 0.1-0.2 length of eyestalk; lateral projeetions broad and obtuse, about as long as or half as long as rostrum. Cervical groove remarkable, situated on posterior third of carapaee. Pereiopod 3 sternite (Fig. 7E) with Y-shaped thickening narrow, medially contiguous on posterior half; each lateral platform with transverse row of setae.

Eyestalks medially contiguous, converging anteriorly to truncate tip, reaehing slightly longer (holotype) or shorter (paratype) than antennular basal segment. Pigmented area large, subterminal. Antennular basal segment 1.2 times as long as segment 2, latter thick, about 0.6 of length of distal segment; flagella about 1.5 times length of peduncle. Antennal pedunele exceeding antennular by distal part of distal segment, scaphocerite small rounded protuberance; flagellum 23mm in length, about 2.8 times as long as antennular flagella.

Maxilliped 3 (Fig. 8A, B) basis proximally with row of 4 spines on inner surfaee. Ischium and merus forming broad plate, latter with sinous row of 26 (paratype, ♂)-29 (holotype, ♀) spines on inner surface. Carpus triangularly expanded on distal margin; propodus subsquare with convex ventral margin; dactylus slender, about as long as propodus.

Pereiopod 1 in female similar, slightly unequal. Larger eheliped (Fig. 8C) in right side. Ischium slender, unarmed, and about 3 times as long as broad. Merus twice as long as broad in midline, shorter than ischium; dorsal margin smooth, evenly convex and ventral more convex than dorsal, finely dentieulate. Carpus and chela broad, compressed; carpus about as long as broad in midline, subequal to merus on dorsal margin, chela about twice length of carpus. Fixed finger slender and incurved distally, finely denticulate on cutting edge, increasing in size proximally. Dactylus exceeding fixed finger at tip, equal in length to dorsal margin of palm; cutting edge proximally concave, finely serrated with central notch and broadly incurved distally. Smaller cheliped (Fig. 8D) on left side. Ischium and merus unarmed, eaeh about equal in length. Carpus and chela eompressed, former longer than merus and about 1.5 times as long as broad, latter longer than carpus. Fixed finger shorter than palm, finely serrated on cutting edge. Dactylus about 1.5 times length of palm in dorsal line, cutting edge smooth, broadly concave distally.

Pereiopod 3 (Fig. 8E) earpus triangularly broadened on ventral margin, propodus with rounded posterior lobe distinctly exceeding ventral margin of carpus.

Pleopod 1 (Fig. 8H) in male uniramous, two-segmented, distal segment broad and concavc on distal margin; pleopod 2 (Fig. 8I) biramous, leaf-like, larger than in female. Pleopod 1 (Fig. 8F) in female uniramous, three-segmented; pleopod 2 (Fig. 8G) biramous, narrow leaf-like, appendix interna short rod-like, situated on distal part of medial margin.

Telson (Fig. 7F) about two-thirds length of abdominal somite 6, about 1.2 times as wide as long, widest on proximal two-fifths, eonverging posteriorly in posterior three-fifths; distal margin narrow and 0.5 as long as greatest width at base; dorsal surface slightly concave mesially with mesial slit posterior to middle transverse row of setae and with longitudinal rows of setae along both sides. Uropodal exopod broadly developed, broader than long, exeeeding endopod. Endopod subsquare, about as long as broad, slightly longer than telson.

Etymology. The species is dedicated to the collector of the holotype, P. Horner.

Remarks. The present species is very similiar to *N. indica* and *N. darwinensis* in the shape of the 3rd maxillipeds, tail-fan and eyestalks. In *N. indica*, however, the apex of the eyestalk is provided with some blunt tubercles, the posterior margin of the propodus of the 3rd pereiopods is not protuberant but parallel to the ventral margin of the carpus, while in *N. horneri* the apex of the eyestalks is also smooth and truneate, and the

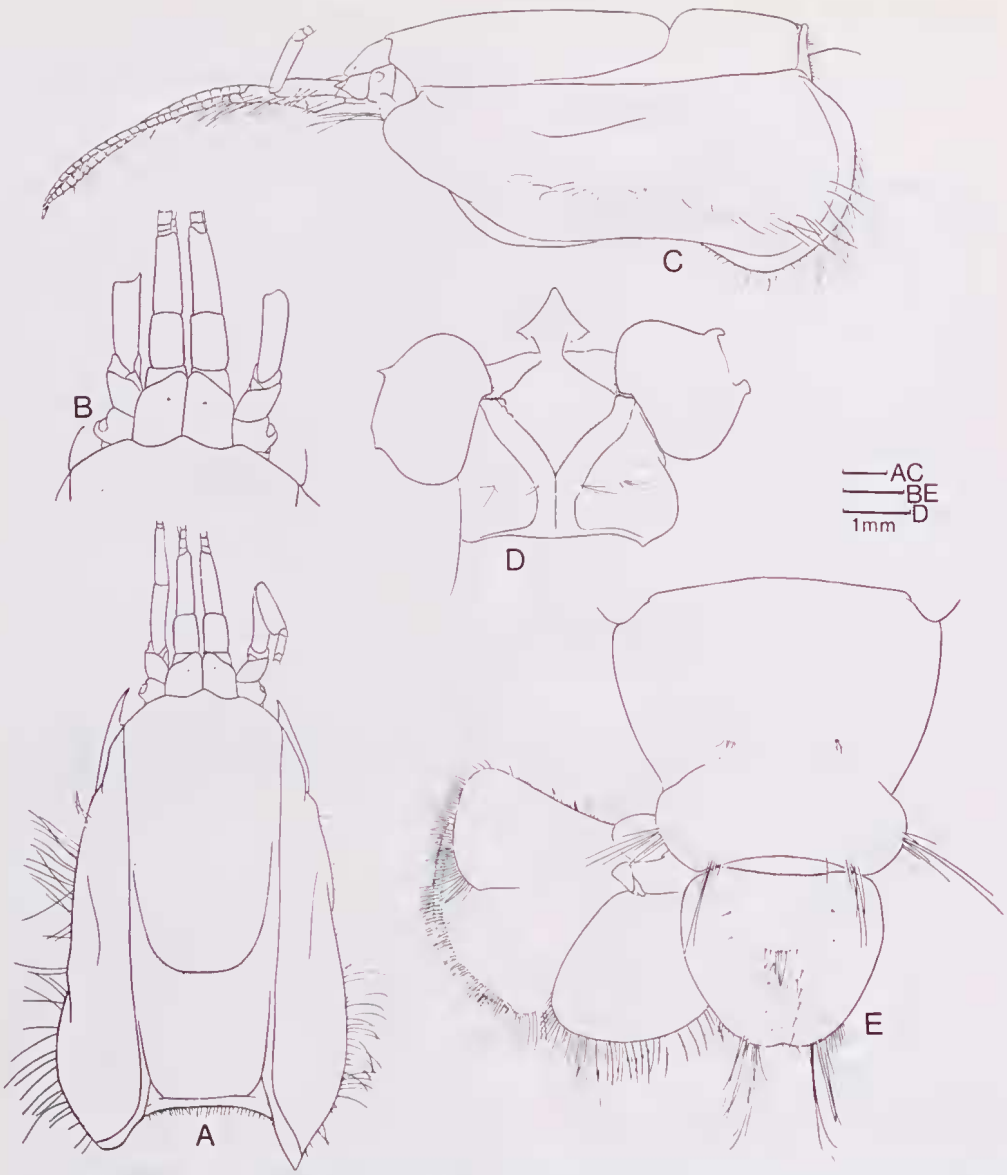

Fig. 9. *Neocallichirus caechabitator* holotype ♀ : **A,** carapace and antennae, dorsal aspect; **B,** anterior carapace, dorsal aspect; **C,** carapace and antennae, lateral aspect; **D,** third sternite, ventral aspect; **E,** sixth abdominal segment and tail-fan, dorsal aspect.

posterior margin of the propodus of the 3rd pereiopod is more protuberant posteriorly than the ventral margin of the carpus.

Both *N. horneri* and *N. darwinensis,* both collected from Darwin, may be compared with each other as follows.

N. darwinensis	*N. horneri*
Y-shaped thickening of pereiopod 3 sternite broadened with 2 tufts of setae.	Y-shaped thickening narrowly swelling without setose tufts; lateral platform with transverse row of setae.
Pigmented area of cornea compact	Pigmented area of cornea large.
Antennular segment 2 short, 0.5 length of terminal.	Antennular segment 2 slightly elongate 0.6 length of terminal.
Antennal peduncle exceeding antennular by proximal part of terminal segment.	Antennal peduncle exceeding antennular by distal part of terminal segment.
Telson about half of abdominal somite 6.	Telson about two-thirds length of abdominal somite 6.

Distribution. Darwin (type locality) and West Shoal Bay, Northern Territory, intertidal zone.

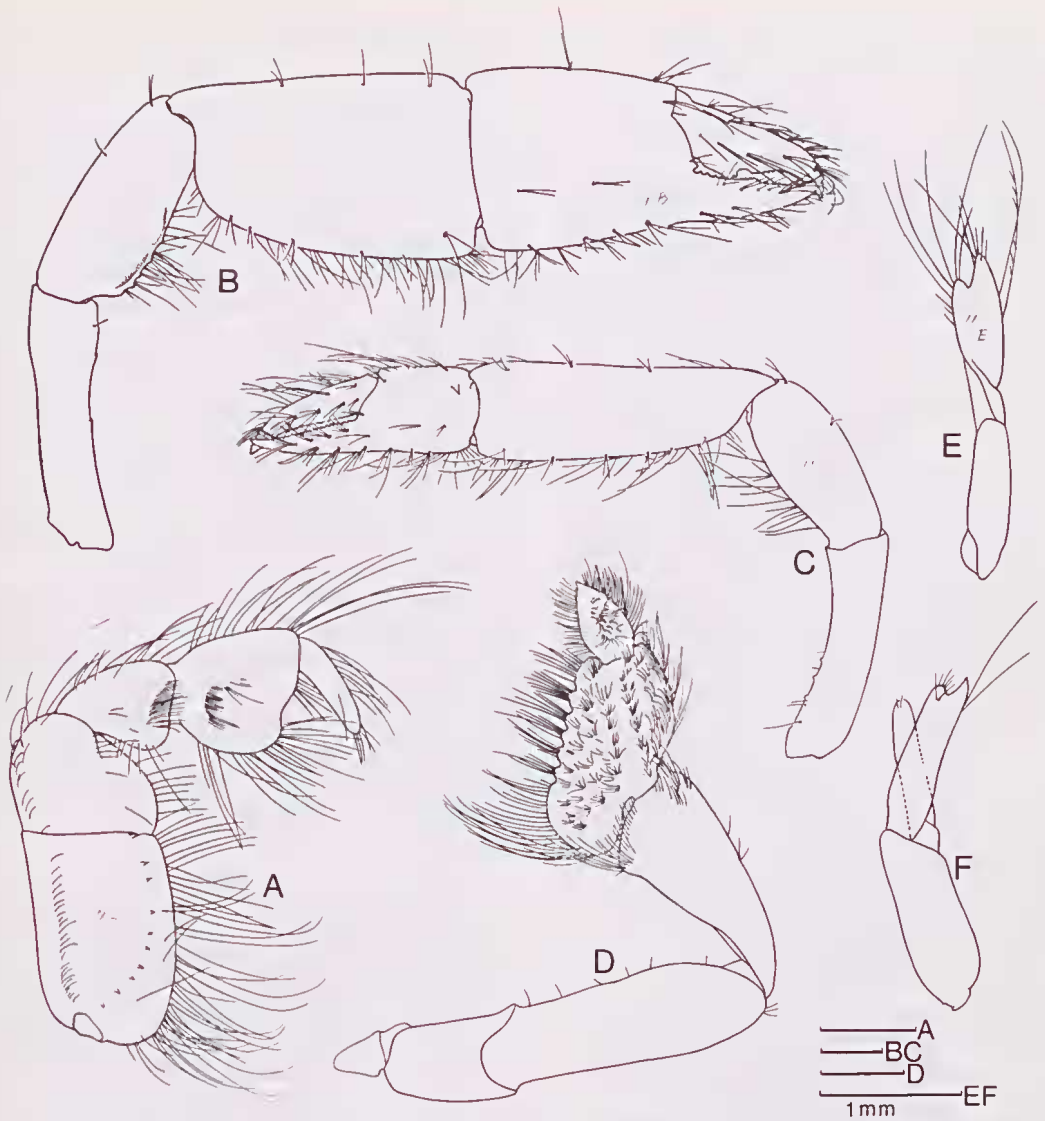

Fig. 10. *Neocallichirus caechabitator* holotype ♀ : **A,** third maxilliped, outer aspect; **B,** larger cheliped, outer aspect; **C,** smaller cheliped, outer aspect; **D,** third pereiopod, outer aspect; **E,** first pleopod in female; **F,** second pleopod in female.

Neocallichirus caechabitator sp. nov.

(Figs 9-10)

Type material. HOLOTYPE — ♀, NTM Cr.00803, TL 35mm, CL 9mm, False Creek Point, Shoal Bay, Darwin, Northern Territory, 1.0m, 24.i.1977, Northern Territory Fisheries Department.

Description. Female. Probably immature. Rostrum (Fig. 9A-C) broadly-based downturned, triangular, about 0.2 times as long as eyestalks; lateral projections obscure. Cervical groove situated on posterior third of carapace. Pereiopod 3 sternite (Fig. 9D) narrowly edged on posterior margin, Y-shaped thickening broad, each medially contiguous on posterior half and with tuft of setae; lateral platform with tuft of setae.

Eyestalks touching medially, obliquely truncate distally, not exceeding distal margin of antennular basal segment; pigmented area small, subdistal. Antennular basal segment longer than segment 2, latter about two-thirds length of terminal segment; flagella subequal, about 1.5 times as long as peduncle. Antennal peduncle exceeds antennular peduncle by half length of terminal segment,

penultimate segment longer than terminal; seaphoeerite rudimentary; flagellum 16mm in length.

Maxilliped 3 (Fig. 10A) isehium and merus combined forming broad plate, latter with spinous row of 10 spinules on inner surfaee. Carpus triangularly expanded on distal margin; propodus subsquare, broadened on ventral half and slightly eoneave on anterodistal margin; daetylus slender, about as long as propodus.

Pereiopod 1 unequal. Larger cheliped (Fig. 10B) on right side. Isehium slender, about 3.5 times as long as broad, with two dentieles on ventral margin. Merus about twiee as long as broad, slightly shorter than isehium; ventral margin evenly inereasing proximally in breadth, armed with row of six dentieles and tufts of setae, dorsal margin entire. Carpus and ehela expanded in breadth, former 1.6 times as long as broad and about 1.3 times as long as merus. Chela about 1.2 times as long as carpus; propodus about as long as merus on dorsal margin; eutting edge of fixed finger shortly notehed proximally, medially eonvex in low triangular form, armed with more than ten dentieles, distally ineurved. Dactylus about two-fifths length of propodus; eutting edge eonvex on proximal third, distally incurved. Smaller eheliped (Fig. 10C) on left side. Isehium slender, about four times as long as broad. Merus more than twiee as long as broad and about two-thirds length of isehium. Carpus elongate, about three times as long as broad and 1.7 times as long as merus. Chela 2.7 times as long as broad and three-fourths length of earpus; fixed finger about as long as propodus, eutting edge with seven dentieles on proximal half. Daetylus 1.8 times as long as propodus, eutting edge unarmed.

Pereiopod 3 (Fig. 10D) merus more than 2 times length of isehium. Carpus shorter than merus, inereasing distally in breadth on ventral margin. Propodus 1.8 times as long as broad, ventral margin dentieulate, bearing five isolated tufts of setae, flanked by broad bands of setae; posterior lobe rounded, not extending beyond ventral margin of earpus. Daetylus less than half length of propodus, covered with setae, apically tipped.

Pleopod 1 in female (Fig. 10E), probably in immature form, uniramous, three-segmented, distal segment distally bilobed. Pleopod 2 (Fig. 10F) biramous; exopod distally bilobed and endopod without appendix interna. Pleopods 3-5 biramous, broadened, appendix interna undeveloped.

Telson (Fig. 9E) two-thirds length of adbominal somite 6, slightly broader than long, widest proximally, tapering posteriorly on distal two-thirds to eonvex postero-distal angle; distal margin narrow, slightly eoneave at middle; dorsal surface with transverse row of setae, and posteriorly medially eoncave to distal margin. Uropodal endopod subsquare, distally rounded, longer than broad, slightly exeeeding telson; exopod broadly rounded on distal margin, median ridge eonspieuous on distal half.

Etymology. This speeies is named from the latin words *caec* meaning blind and *habitator* meaning inhabitant, that is, it has eyes so small as to be effeetively blind.

Remarks. The present speeies is elosely related to *N. indica* and *N. moluccensis* in the shape of the 3rd maxillipeds, the tail-fan, and in the relative length between the antennal and the antennular peduneles. However in *N. caechabitator* the pigmented area of eyestalks is small, while in these two Indonesian speeies it is well developed in shape.

ACKNOWLEDGEMENTS

I am mueh indebted to Dr A.J. Bruee, Northern Territory Museum, Darwin, Australia, for providing me with the speeimens and data, and also for reading the manuseript, and to Dr M. Malipatil for valuable adviee on the eompletion of the manuseript.

REFERENCES

Baker, W.H. 1907. Notes on the South Australian deeapod Crustacea. Part 5. *Transactions Royal Society of South Australia* **31**:173-191.

Barnard, K.H. 1946. Deseriptions of new speeies of South African Deeapod Crustaeea, with notes on synonymy and new reeords. *Annals and Magazine of Natural History* (2) **13**:361-392.

Dana, J.D. 1852. Crustacea. In: *United States Exploring Expedition during the years 1838–1842, under the command of Charles Wilkes, U.S.N.* **13**:1-1620, atlas (1855), 96 Pls

de Saint Laurent, M. see Saint Laurent, M. de

Fulton, S.W. and Grant, F.E. 1906. Some little known Vietorian Deeapod Crustaeea, with deseriptions of new speeies. *Proeeedings of the Royal Society of Victoria* **19**:5-15.

Gaillande, D. de and Lagardère, J.P. 1966. Deseription de *Callianassa (Callichirus) lobata* nov. sp. (Crustaeea Deeapoda Callianassidae). *Recueil*

des Travaux de la Station Marine d'Endoume Faculté des Sciences de Marseille **56**:259-265

Gibbes, L.R. 1850. On the carcinological collections of the United States and an enumeration of the species contained in them, with notes on the most remarkable, and descriptions of new species. *Proceedings of the American Association for the Advancement of Sciences, 3rd meeting* :167-201.

Holthuis, L.B. and Gottlieb, E. 1958. An annotated list of the Decapod Crustacea of the Mediterranean coast of Israel, with an appendix listing the Decapoda of the eastern Mediterrancan. *Bulletin of the Research Council of Israel Section B Zoology* **7B**(1-2):1-126.

Kishinouye, K. 1926. Two rare and remarkable forms of macrurous Crustacea from Japan. *Annotationes Zoologicae Japonenses* **11**:63-70.

Leach, W.E. 1814. Crustaccology. In: D. Brewster (ed.) *Edinburgh Encyclopaedia Edinburgh* **7**(2): 383-436.

Le Loeuff, P. and Intes, A. 1974. Les Thalassinidea (Crustacea, Decapoda) du Golfe de Guinéc, Systématiquc — Ecologie. *Cahiers ORSTOM Serié Oceanographie* **12**:17-69

Man, J.G. de 1888. Bericht Über die im Indischen Archipel von Dr. J. Brock gesammelten Decapoden und Stomatopoden. *Archiv für Naturgeschichte* **53**:215-600.

Man, J.G. de 1905. Diagnoses of new species of Macrurous Decapod Crustacea. PA from the "Siboga-Expedition". *Tijdschrift der Nederlandsche dierkunduge Vereeniging* (2) **9**:587-614.

Man, J.G. de 1928. The Decapoda of the Siboga-Expedition. Part VII. The Thalassinidae and Callianassidae collected by the Siboga-Expedition, with some remarks on the Laomediidae. *Siboga Expeditie, Monographie* **39**(a6):1-187.

Manning, R.B. 1987. Notes on Western Atlantic Callianassidae (Crustacea: Decapoda: Thalassinidea). *Proceeding of the Biological Society of Washington* **100**:386-401.

Manning, R.B. and Felder, D.L. 1986. The status of the callianassid genus *Callichirus* Stimpson, 1866 (Crustacea: Decapoda: Thalassinidea). *Proceedings of the Biological Society of Washington* **99**:437-443.

Miers, E.J. 1884. Crustacea. In: *Report on the Zoological Collections made in the Indo-Pacific Ocean during the Voyage of H.M.S. "Alert" 1881-2.* British Museum, London :178-322, 513-575.

Milne Edwards, A. 1870. Revision du genre *Callianassa* (Leach). *Archives du Muséum National d'Histoire Naturelle Paris (Nouvelles)* **6**:75-102.

Montagu, G. 1808. Description of several marine animals found on the South Coasts of Devonshire. *Transactions of the Linnean Society of London. Zoology* **9**:81-114.

Poore, G.C.B. 1975. Systematics and distribution of *Callianassa* (Crustacea, Decapoda, Macrura) from Port Phillip Bay, Australia, with descriptions of two new species. *Pacific Science* **29**:197-209.

Poore, G.C.B. and Griffin, D.J.G. 1979. The Thalassinidea (Crustacea: Decapoda) of Australia. *Records of the Australian Museum* **32**(6):217-321.

de Saint Laurent, M. 1974. Sur la systématique et la phylogénie des Thalassinidea: définition des familles des Callianassidae et des Upogebiidae et diagnoses de cinq genères nouveaux (Crustacea Decapoda). *Comptes Rendus de l' Académie des Sciences Paris* (D) **277**:513-516.

de Saint Laurent, M. 1979. Sur la classification et la phylogenie des Thalassinides: definitions de la superfamille des Axioidea, de la sous-famille des Thomassiniinae et de deux genères nouveaux (Crustacea Decapoda). *Comptes Rendus de l' Académie des Sciences Paris* (D) **288**:1395-1397.

Sakai, K. 1967. Three new species of Thalassinidea (Decapod Crustacea) from South-West Japan. *Publications of Seto Marine Biological Laboratory* **15**:319-328.

Sakai, K. 1984. Some Thalassinideans (Decapoda: Crustacea) from Heron Is., Queensland, Eastern Australia, and a new species of *Gourretia* from East Africa. *The Beagle, Occasional Papers of the Northern Territory Museum of Arts and Sciences* **1**(11):95-108.

Schmitt, W.L. 1935. Mud shrimps of the Atlantic coast of North America. *Smithsonian Miscellaneous Collections* **93**(2):1-21.

Stimpson, W. 1866. Descriptions of new genera and species of macrurous Crustacea from the coasts of North America. *Proceedings of the Chicago Academy of Sciences* **1**:46-48.

Strahl, C. 1882. Über einige neue von Hrn. F. Jagor eingesandte Thalassinen und die systematische Stellung dieser Familie. *Monatsberichte der Deutschen Akademie der Wissenschaft zu Berlin* **1861**:1055-1072.

Ward, M. 1945. A new crustacean. *Memoirs of the Queensland Museum* **12**:134-135.

Accepted 24 June 1988